PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Ralph Bauer et al.		
Title:	SURFACE COATING SOLUTION		
App. No.:	10/823,400	Filed:	April 13, 2004
Examiner:	Tae H. Yoon	Group Art Unit:	1714
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Atty. Dkt. No.:	1035-A4363		

MS AF
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. §1.132

Sir, I hereby declare and state:

1. I am a joint inventor of the subject matter presently claimed in the above-identified patent application.

2. I received my undergraduate degree in Metallurgical and Materials Engineering from Middle East Technical University, Ankara, Turkey in 1997, received my M.S. degree in Ceramic Engineering from Alfred University in 1998, and received my Ph.D. in Materials Science and Engineering from Pennsylvania State University in 2001.

3. For over 6 years, I have been involved in the research and development of alumina powders. Since 2001, I have been employed by Saint-Gobain Ceramics & Plastics, Inc. (or its predecessor companies), during which time I have primarily been engaged in research and development of alumina powders.

4. I have reviewed the substance of the Office Action mailed August 30, 2007 and have reviewed Bugosh (US 2,915,475), Yoshino et al. (US 6,576,324), and Napier (US 3,357,791).

5. Background. The claimed invention is directed to a surface coating solution including a surface coating base and boehmite particles provided in the surface coating base in an amount of 0.1wt% to 20.0wt%. The boehmite particles are mainly anisotropically shaped particles having an aspect ratio of at least 3:1. The surface coating solution has flow and leveling of at least 6 mils.

The claimed flow and leveling properties and other claimed thixotropic properties, including set-to-touch dry time, sag resistance, and viscosity recovery were found to result from particular process features for forming surface coating solutions, coupled with use of anisotropic boehmite particles. Such notable process features include activation of the boehmite particles prior to incorporating the boehmite particles into a grind solution.

6. Activation of Boehmite Particles.

As disclosed in the specification, anisotropic boehmite particles may be activated through treatment with an ammonium source, such as ammonium hydroxide, or through treatment with an alkali or alkali earth metal salt. Such activated boehmite particles, when incorporated in a solution, contribute to desirable thixotropic and viscous properties of the solution, notably the claimed flow and leveling characteristics. In contrast, when the anisotropic boehmite particles are not activated, the desired thixotropic and viscous properties are absent from the solution.

In addition to the examples provided in the present specification, the influence of activation on the viscous properties of anisotropic boehmite particles is shown by the graphs provided in Exhibit A (see attached). Aqueous solutions including anisotropic boehmite particles (CAM 9010X, available from Saint-Gobain Ceramics and Plastics Corporation) at solids loading of approximately 20.0 wt% were prepared. A first sample also included 2.0wt% ammonium hydroxide, while a second sample was free of activating agents. As illustrated in FIG. A1, shear stress versus shear rate curves are significantly different for the two samples. In particular, the activated sample shows a larger hysteresis than the unactivated sample, indicative of the desired thixotropic properties. Such differences are further illustrated in FIG. A2, where the illustrated viscosities are two orders of magnitude greater in the activated anisotropic boehmite particles than in the unactivated boehmite particles. Further, such properties are stable, as illustrated by Example 1 of the present specification.

Accordingly, when such activated anisotropic boehmite particles are incorporated in a surface coating solution, such as a latex paint, for example, in amounts between 0.1 wt% and 20 wt%, the particles impart desirable thixotropic and viscous properties to the coating solution. For example, as disclosed in the present specification, when activated anisotropic boehmite particles are incorporated into a grind solution that is then used to form a latex coating solution, the resulting latex coating solution has desirable thixotropic and viscous properties, such as flow and leveling as recited in the independent claims, as well as desirable sag resistance, set-to-touch dry time, and shear viscosity recovery as recited in the dependent claims.

7. <u>The prior art</u>.

Bugosh is directed to fibrous aluminum monohydrate particles. Bugosh further discloses that fibrous boehmite can be used as reinforcing filler in making plastic films, coatings, paints, adhesives, or other plastic articles. The fibrous boehmite may be mixed with aqueous dispersions of polymers. (Bugosh, col. 29, ll. 1-21). However, Bugosh is silent regarding characteristics of the coatings and paints, such as flow and leveling, sag resistance, and set-to-touch dry time characteristics. While, as disclosed by Bugosh, it may have been known to incorporate boehmite into coatings, paints, and adhesives, Bugosh is silent regarding activating the boehmite particulate and is silent regarding the process for forming aqueous dispersions of polymers.

Yoshino is directed to a printing medium provided on a base material with a porous ink receiving layer which includes an alumina hydrate and a binder. Yoshino is silent regarding activating anisotropic boehmite particles and does not disclose flow and leveling values, sag resistance and dry time, shear viscosity recovery, and pH.

Napier is directed to a process for producing colloidal sized particles of alumina monohydrate. Napier further discloses that fibrous boehmite may be used at a concentration of 0.5 to 25% in aqueous floor wax emulsions or pastes utilizing conventional components. (Napier, col. 11, ll. 63-71). Napier is silent regarding activation of anisotropic boehmite particles and does not teach or suggest the claimed flow and leveling characteristics.

In contrast to the cited references, my co-inventors and I have discovered that the present anisotropic boehmite particles, when used in the process outlined in the present specification, advantageously produce surface coatings having desirable characteristics, such as desirable flow and leveling, sag resistance, set-to-touch dry time, and shear viscosity recovery. Specifically, we have discovered that such desirable properties in a surface coating, such as a latex paint, *result from activating anisotropic boehmite particles prior to incorporating such particles into a latex solution*.

8. Summary. Among the features disclosed in the present application, the above-mentioned activation of anisotropic boehmite particles particularly contributes to a successful formation of a surface coating solution having the claimed properties. As illustrated by the examples provided, failure to activate the otherwise identical anisotropic boehmite yields a solution with lower viscosity and less pronounced thixotropic properties. The foregoing innovations were created by my co-inventors and me through extensive research and development, and are at least partly the result of empirical studies on the notable engineering hurdles associated with the formation of surface coating solutions.

9. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like, so made, are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Respectfully submitted,

01/29/08

Date

Doruk O. Yener, Ph.D.

EXHIBIT A

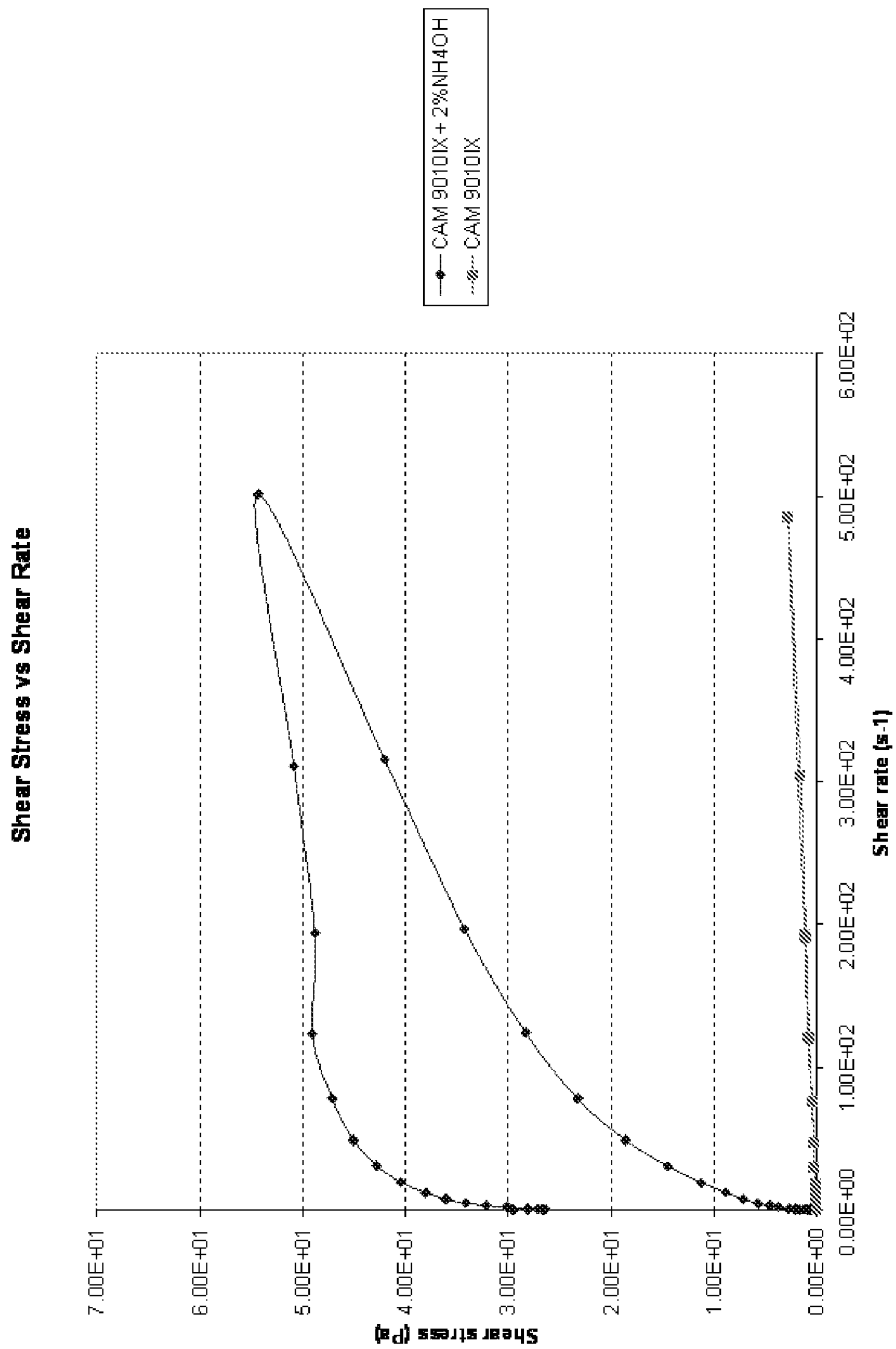

FIG. A1

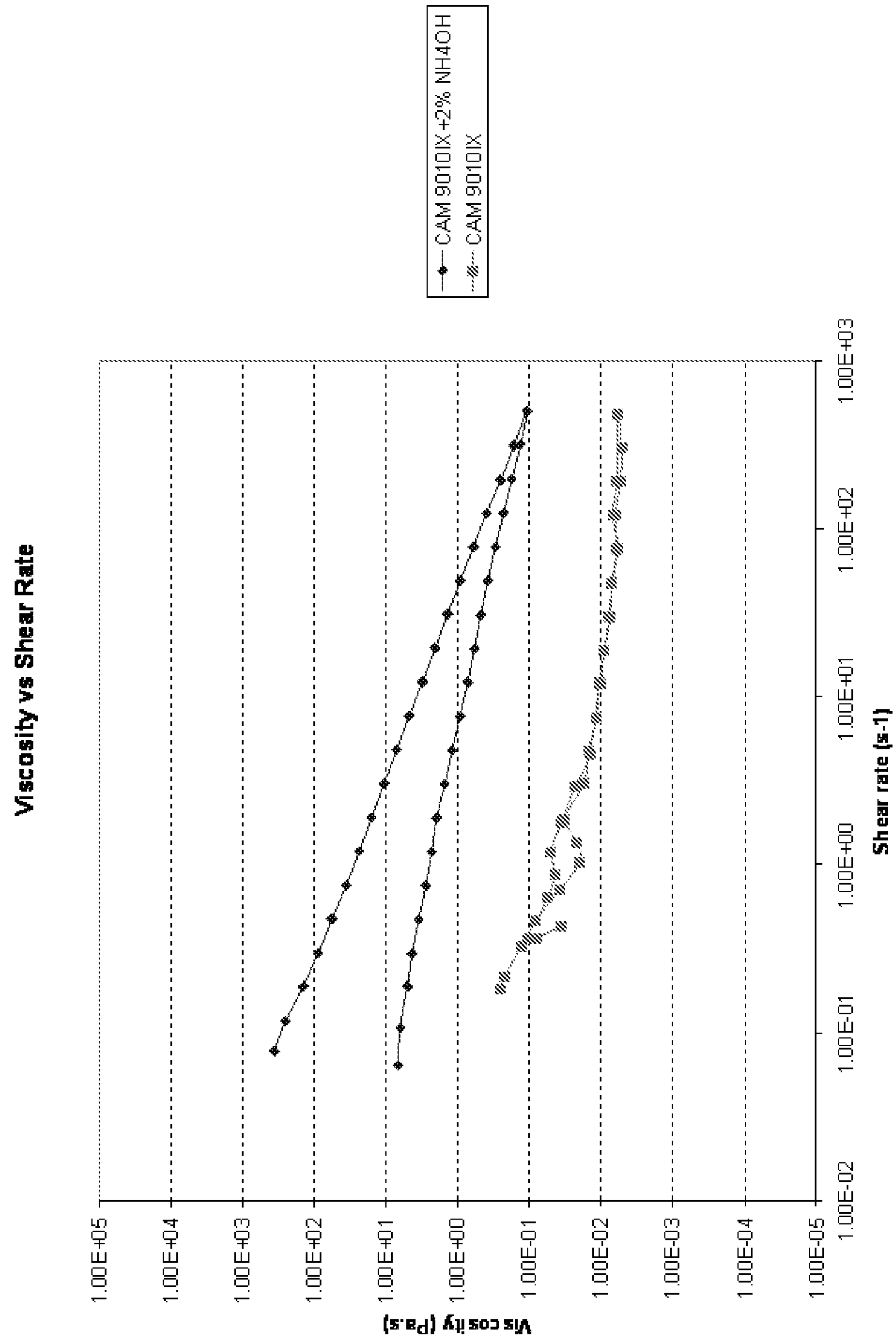
Viscosity vs Shear Rate
Viscosity (Pa.s)
Shear rate (s-1)
CAM 9010IX +2% NH4OH
CAM 9010IX
1.00E+05
1.00E+04
1.00E+03
1.00E+02
1.00E+01
1.00E+00
1.00E-01
1.00E-02
1.00E-03
1.00E-04
1.00E-05
1.00E-02
1.00E-01
1.00E+00
1.00E+01
1.00E+02
1.00E+03

FIG. A2